

REMARKS

The Office Action mailed August 15, 2003 has been carefully reviewed and the foregoing amendments are made in response thereto. In view of the amendments and the following remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Amendments to the specification and claims

Substitute Sequence Listing. In order to conform with the sequence rules, Applicants have herein provided a substitute sequence listing both in paper and Computer Readable Format (CFR). The substitute listing includes sequences disclosed in the as-filed specification and figures that were not included in the previously-filed sequence listing (*i.e.*, SEQ ID Nos: 21-43). The specification has been amended to provide references to the substitute sequence listing information where appropriate. None of the sequences newly added to the sequence listing are specifically claimed in any of the pending claims.

Reference to prior applications. The specification has been newly amended to provide a specific reference to the prior applications, as requested by the Examiner.

Insertion of Table 1. The specification has also been amended to insert Table 1. The Office Action notes that “no Table 1 could be found anywhere in the application file” and states that “any reference to Table 1 in the specification should be deleted” (Office Action dated 08/15/2003, Paper Number 10, page 2, last paragraph) The Examiner invites Applicants to submit Table 1 via a Declaration. Applicants have hereby properly inserted Table 1 into the current application.

The current application is a divisional of U.S. Patent Application No. 08/945,722 (“the ‘722 application”). The ‘722 application has Attorney Docket Number 1627. The current application has Attorney Docket Number 1627D. At Paragraph Number 18, The Utility Patent Application Transmittal for Attorney Docket Number 1627D (*i.e.*, the current application) indicates that the application is a “Divisional” of the ‘722 application and states the following:

“The entire disclosure of the prior application, from which an Oath or Declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying Continuation or Divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.” (underlining in original) (Note: Box 5b indicates that the Oath or Declaration is from [the] prior application.)

Thus, the entire ‘722 application is incorporated by reference into the current application for the express purpose of relying on it for subject matter inadvertently omitted. This satisfies the requirements of M.P.E.P. § 201.06(c), “Incorporation By Reference” at page 200-37, for reliance upon a parent application for material inadvertently omitted in the child application. Furthermore, the as-filed copy of page 21 of the current application specifically states “Table 1 to be inserted here”. This statement constitutes a clear intent that on the day of the filing that Table 1 was to be included in the divisional application. The ‘722 application is an exact copy of international application PCT/GB96/01075, which includes Table 1 on page 29 and as Substitute Sheets (Rule 26) on pages 29/1 to 29/29/4 (Note: The Substitute Sheets provide a magnified copy of Table 1 so as to comply with font size requirements.). In summary, the present amendment to insert Table 1 is proper for the following reasons: 1) ‘722 parent application included Table 1; 2) there is a specific reference to Table 1 in the current application; and 3) the entire disclosure of the ‘722 application was incorporated by reference in the current application.

Claim Amendments. Claims 27-33, 34-35, 37, 42, 49-50, 53, 55, 57, 59 and 61 have been newly amended.

Claim 27 has been amended to more clearly define the claimed invention. Support for the amendments can be found throughout the specification. As regards support for adding the word “isolated” to claim 27 and to the claims which depend from this claim, see, *e.g.*, page 5, last paragraph (“the invention provides the polypeptide in substantially pure form, especially in a form free from other plant-derived (especially potato plant-derived) components”) and page 14, lines 23-25 (“Clones ranging in size from 400 bp to 1.4 kb were isolated and sequenced.”). As regards support for the phrase “the amino acid sequence of SEQ ID No: 15”, see, *e.g.*, page 11, last two sentences. As regards support for the phrase “or a fragment thereof comprising at least

400 contiguous amino acids of SEQ ID No: 15”, see, *e.g.*, page 14, lines 23-25 and the paragraph bridging pages 18-19.

Claims 28-32 and 34 were amended to more clearly refer to the sequence listings providing the relevant sequences.

Claims 53, 55, 57, 59 and 61 have been newly amended to incorporate the actual “protocol defined in claim 7” since claim 7 is no longer pending.

The remainder of the claim amendments are addressed below where appropriate.

Applicants respectfully submit that no prohibited new matter has been introduced by the amendments to the claims or specification. As discussed above, support for the amendments to the claims can be found throughout the specification and claims as originally filed. Entry of the amendment is respectfully requested.

Response to the objections to the claims due to informalities

Claim 33 has been objected to as being in improper form because of improper multiple dependency. Applicants have amended the claims from which claim 33 depends so that each of them at the most refers to only one other claim. Thus, multiple dependent claim 33 no longer has an improper multiple dependency. The Examiner is respectfully requested to withdraw the rejection in view of this amendment.

Claims 28-32 and 34 have been objected to for their omission of sequence identifiers. Applicants have amended the claims to include the sequence identifiers. The Examiner is respectfully requested to withdraw the objection in view of this amendment.

Response to the rejection under 35 U.S.C. § 101

Claims 27-34, 49 and 73 stand rejected under 35 U.S.C. § 101 purportedly because the claimed invention is directed to non-statutory subject matter in that the claimed nucleic acid molecules are not specified as being in an isolated state. The claims have been amended to insert the word “isolated” before the claimed nucleic acids. The Examiner is respectfully requested to withdraw the objection in view of this amendment.

Response to rejections under 35 U.S.C. § 112, first paragraph

Claims 27-37, 42-51, 53-63, 67-68 and 73 are rejected under 35 U.S.C. § 112, first paragraph, as purportedly failing to comply with the written description requirement and as failing to provide enablement for the full scope of the claim. The Office Action states that “the specification only demonstrates the isolation and characterization of a full-length, native potato class A starch branching gene encoding SEQ ID NO: 15, and plant transformation with a fragment of the native gene of at least 1200 contiguous bases pairs which is inserted into the plant in antisense orientation with respect to the promoter.”

While not acquiescing to the rejection and in an effort to further prosecution, Applicants have newly amended the claims to refer to isolated nucleotide sequences which encode “the amino acid sequence of SEQ ID No. 15 or a fragment thereof comprising at least 400 contiguous amino acids of SEQ ID No. 15” or to specifically refer to nucleotide sequences identified with a SEQ ID No. that have at least 1,200 contiguous base pairs. The Examiner is respectfully requested to withdraw the rejection in view of this amendment.

Applicants’ claims to plant transformation, however, should not be limited to plant transformation using the nucleotides of the present invention in an antisense orientation. The specification clearly provides sufficient support for plant transformation using the nucleotides in a sense orientation. See, *e.g.*, page 6, second full paragraph, which describes “sense suppression” and methods of accomplishing same. Therefore, the Examiner is respectfully requested to withdraw this rejection in view of Applicants’ amendments and comments.

Response to rejections under 35 U.S.C. § 112, second paragraph

Claims 28-29 and 50 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite in their recitation of “sequence” in line 2, second occurrence. While not acquiescing to the rejection and in an effort to further prosecution, claims 28 and 29 have been newly amended so as to more clearly define the sequences claimed by Applicants. No purportedly indefinite recitations of “sequence” remain in either of these two claims as presently amended. The Examiner is requested to withdraw the rejection in view of these amendments.

Response to rejections under 35 U.S.C. §§ 102(e) and 102(b)

The pending claims have been rejected over various “prior art” documents under 35 U.S.C. §§ 102(e) and 102(b) due to the allegedly broad scope of the previously-pending claims.

While not acquiescing to the rejection and in an effort to further prosecution, Applicants have newly amended the claims to more particularly point out the invention, mostly along the lines suggested by the Examiner. As a result of these amendments, the cited “prior art” is believed to be no longer applicable to the currently pending claims and the Examiner is respectfully requested to withdraw these rejections.


Conclusion

In view of the foregoing remarks, Applicants respectfully request withdrawal of all outstanding rejections and early notice of allowance to that effect. Should the Examiner believe that a telephonic interview would expedite prosecution and allowance of this application, she is encouraged to contact the undersigned at her convenience.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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Table 1

Sample description	Sample number	Tuber SBE activity (μg starch)	DSC		Viscositylograph			(RVA)		Apparent amylose content [% w/w]	Phosphorus content (mg/100g)
			Peak temperature [°C]	Onset temperature [°C]	Peak viscosity (SHU)	Pasting viscosity (SHU)	Set-back viscosity (SHU)				
Untransformed control	148	7.6	65.8	65.5	545	161	200	31.2	68		
	243	22.2	nd	62.6	761	135	241	29.1			
AS-Class A SBE	152	12.7	69.5	70.9	467	380	529	37.5	69		
	249	13.9	nd	70.0	497	434	518	38.5			
AS-Class B SBE (17) (control)	145	0.7	68.9	68.8	669	177	305	29.8	111		
AS-Class B SBE (17) + AS-Class A SBE	150	0.6	74.0	86.0	214	214	303	53.1	188		
	161	0.5	73.0	76.6	349	324	616	40.9	208		
AS-Class B SBE (18) (control)	144	1.6	64.5	64.7	714	154	258	29.0	97		
AS-Class B SBE (19) + AS-Class A SBE	149	3.0	66.5	69.9	474	267	482	35.6	127		
AS-Class B SBE (15) (control)	172	0.22	nd	65.4	707	187	280	28.8	130		
AS-Class B SBE (15) + AS-Class A SBE	201	0.10	nd	>95	no peak	12	13	66.4	210		
	208a	0.10	nd	>95	no peak	15	17	64.1			
	208	0.30	72.8-80.5	>95	no peak	14	10	62.8	240		
	202	0.02	nd	89.4	no peak	172	245	57.9			
	212	1.40	nd	78.0	308	288	541	49.5			
	220	1.40	nd	75.8	355	345	593	44.1			
AS-Class B SBE (12) (control)	170	0.2	nd	68.5	766	202	303	27.8			
AS-Class B SBE (12) + AS-Class A SBE	236	0.7	nd	95.0	no peak	23	14	60.4			
	236a	0.9	nd	91.2	no peak	139	192	58.7			
	230a	0.8	nd	77.6	244	239	450	48.2			

RVA profile

50°C (2 min), 50-95°C (1.5°C/min), 95°C (15 min), 95-50°C (1.5°C/min), 50°C (15 min)

Pasting viscosity (47 min)

at end of 50°C (2 min), 50-95°C (1.5°C/min), 95°C (15 min)

Set-back viscosity (92 min)

at end of profile

SBE

Starch Branching Enzyme

Instrument "Stirling Number Units" (arbitrary units)

SNU

not determined

nd

21b

Table 1

Sample description	Sample number	Tuber SBE activity (U/g starch)	DSC	
			Peak temperature (°C)	Onset temperature (°C)
Untransformed control	146	7.6	65.8	65.5
	243	22.2	nd	62.6
AS-Class A SBE	152	12.7	69.5	70.9
	249	13.9	nd	70.0
AS-Class B SBE (17) (control)	145	0.7	68.9	66.8
AS-Class B SBE (17) + AS-Class A SBE	150	0.6	74.0	86.0
	161	0.5	73.0	76.6
AS-Class B SBE (18) (control)	144	1.6	64.5	64.7
AS-Class B SBE (18) + AS-Class A SBE	149	3.0	68.5	69.9

21c

Viscoamylograph			(RVA)		Apparent amylose content (% w/w)	Phosphorus content (mg/100g)
Peak viscosity (SNU)	Pasting viscosity (SNU)	Set-back viscosity (SNU)				
545	161	280	31.2	68	31.2	68
761	135	241				
467	380	529	37.5	89	37.5	89
497	434	518				
669	177	305	29.8	111	29.8	111
214	214	303				
349	324	618	53.1	198	53.1	198
714	154	258				
474	267	482	29.0	97	29.0	97
			35.6	127	35.6	127

SUBSTITUTE SHEET (RULE 26)

AS-Class B SBE (15) (control)	172	0.22	nd	65.4
AS-Class B SBE (15) + AS-Class A SBE	201	0.10	nd	>95
	208a	0.10	nd	>95
	208	0.30	72.8-80.5	>95
	202	0.02	nd	89.4
	212	1.40	nd	78.0
	220	1.40	nd	75.8
AS-Class B SBE (12) (control)	170	0.2	nd	66.5
AS-Class B SBE (12) + AS-Class A SBE	236	0.7	nd	95.0
	236a	0.8	nd	91.2
	230a	0.8	nd	77.6

RVA profile

Pasting viscosity (47 min)

Set-back viscosity (92 min)

SBE

SNU

nd

50°C (2 min), 50-95°C (1.5°C/min), 95°C (15 min), 95-50°C (1.5°C/min), 50°C (15 min)

at end of 50°C (2min), 50-95°C (1.5°C/min), 95°C (15 min)

at end of profile

Starch Branching Enzyme

Instrument "Stirring Number Units" (arbitrary units)

not determined

21e

707	167	290	28.8	130
no peak	12	13	66.4	210
no peak	15	17	64.1	
no peak	14	19	62.8	240
no peak	172	245	57.9	
308	296	541	49.5	
355	345	593	44.1	
768	202	303	27.8	
no peak	23	14	60.4	
no peak	139	192	56.7	
244	239	450	48.2	

SUBSTITUTE SHEET (RULE 26)